



Docket No. 8733.339.00-US  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
In Duk SONG

Customer No. 30827

Application No. 09/737,770

Confirmation No. 8950

Filed: December 18, 2000

Art Unit: 2883

For: IN-PLANE SWITCHING LCD PANEL

Examiner: Timothy L. Rude

MS Appeal Brief – Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPELLANTS' BRIEF**

Sir:

In response to a Final Rejection of all pending claims that was mailed on August 28, 2006, and in support of a "Notice of Appeal" filed November 28, 2006, Appellants hereby submit this Appeal Brief.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefore are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37(c):

- I. Real Party In Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Claimed Subject Matter
- VI. Grounds of Rejection to be Reviewed on Appeal

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VII. Argument

Claims Appendix

Evidence Appendix

Related Proceedings Appendix

**I. REAL PARTY IN INTEREST**

The real party in interest for this appeal is: LG.PHILIPS LCD CO., LTD.

**II. RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

### **III. STATUS OF CLAIMS**

#### **Total Number of Claims in the Application**

There are 32 claims pending in the application.

#### **Current Status of Claims**

Claims canceled: 1 and 20

Claims withdrawn from consideration but not canceled: 11, 19, 35-42

Claims pending: 2-10, 12-18 and 21-34

Claims allowed: None

Claims rejected: 2-10, 12-18 and 21-34

Claims On Appeal: The claims on appeal are claims 2-10, 12-18 and 21-34.

**IV. STATUS OF AMENDMENTS**

The Examiner issued a Final Rejection on August 28, 2006. No amendment has been filed in response to this Final Rejection. Accordingly, the claims enclosed herein as the Claims Appendix reflect the current status of claims 2-19 and 21-34.

**V. SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention is directed to the structure of an in-plane switching mode liquid crystal display device. The device includes an intersection of gate and data lines 100 and 200 with gate and source electrodes 110 and 210 (see FIGs. 9 and 10A) positioned and electrically connected with the gate and data lines 100 and 200, respectively. A drain electrode 220, including a drain contact hole 240, is spaced apart from the source electrode 210 and overlaps a portion of the gate electrode 110. The source electrode 210 also overlaps a portion of the gate electrode 110. A first connecting line 320 electrically contacts the drain electrode 220 through the drain contact hole 240, and is disposed parallel with the gate line 100. A plurality of pixel electrodes 310 are disposed perpendicular to the first connecting line 320, and communicate with the first connecting line 320. Ends of the pixel electrodes 310 are connected with a second connecting line 330 over the common electrode 130. A storage electrode 230 including a storage contact hole 250 is disposed over the common line 120, and electrically contacts the second connecting line 330 through the storage contact hole 250. Namely, each of the pixel electrodes 310 is electrically connected with the storage electrode 230 (see pages 12-14 of original specification).

A plurality of common electrodes 130 are disposed parallel with the pixel electrodes 310, and electrically contact the common line 120. Each common electrode 130 is spaced apart from the adjacent pixel electrodes 310. One end of each of the common electrodes is electrically connected to one another. The common line 120 and the gate and data lines 100 and 200 are an opaque metal, while the common and pixel electrodes 130 and 310 are a transparent conductive material.

In the present invention, the common line 120 and the common electrode 130 (see FIGs. 9 through 11B) are distinct structures that contact one another by overlapping. In FIG. 11A, metal for the common line 120 is first formed on the substrate 1, and then the transparent conductive material is formed on the substrate 1 to overlap a portion of the metal for the common line 120. More particularly, the common line 120 is first formed on the substrate 1, the common electrode 130 is later formed on the substrate 1 such that an end of the common electrode 130 overlaps a portion of the common line 120. In the alternative, as shown in FIG. 11B, the common electrode 130 can be first formed on the substrate 1, and then the common line 120 can be formed so that it overlaps a portion of the common electrode 130. Namely, the transparent conductive material for the common electrode 130 is first formed on the substrate 1,

and then the gate line 100 (see FIG. 9) and common lines 100 and 120 are formed on the substrate 1 to overlap a portion of the common electrode 130. (See page 14)

In either case, the common line 120 and the common electrode 130 are distinct structures that contact each other through an overlapping arrangement.

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The Examiner rejected claims 2, 4, 5, 7, 10, 12, 17, 18, 21, 22 and 33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art (APA) in view of U.S. Patent No. 6,362,858 to Jeon et al. (hereinafter "Jeon"), U.S. Patent No. 6,300,995 to Wakagi et al. (hereinafter "Wakagi") and U.S. Patent No. 6,356,330 to Ando et al. (hereinafter "Ando"). The Examiner rejected claims 13-15 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of U.S. Patent No. 6,323,918 to Yoshioka et al. (hereinafter "Yoshioka"). The Examiner rejected claims 3, 6 and 34 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of U.S. Patent No. 6,278,502 to Colgan et al. (hereinafter "Colgan"). The Examiner rejected claims 8, 9 and 32 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of U.S. Publication No. 2002/0008824 to Son et al. (hereinafter "Son"). The Examiner rejected claims 23-25 and 27-30 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of U.S. Patent No. 6,219,125 to Ishikura et al. (hereinafter "Ishikura"). The Examiner rejected claims 26 and 31 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi, Ando and Ishikura and further in view of Colgan. The Examiner rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi, Ando and Yoshioka and further in view of U.S. Patent No. 6,049,365 to Nakashima et al. (hereinafter "Nakashima").



## VII. ARGUMENT

- A. The Examiner improperly rejected claims 2, 4, 5, 7, 10, 12, 17, 18, 21, 22 and 33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art (APA) in view of U.S. Patent No. 6,362,858 to Jeon et al. (hereinafter "Jeon"), U.S. Patent No. 6,300,995 to Wakagi et al. (hereinafter "Wakagi") and U.S. Patent No. 6,356,330 to Ando et al. (hereinafter "Ando").

In order to support a rejection under 35 U.S.C. § 103(a), the Office Action must establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness three criteria must be met. First, there must be some motivation or suggestion to combine the applied references. Second, there must be a reasonable expectation of success. Finally, the combination must teach each and every claimed element. In the present case, claims 2, 4, 5, 7, 10, 12, 17, 18, 21, 22 and 33 are not rendered unpatentable over the combination of APA, Wakagi, and Ando because the Examiner fails to establish a *prima facie* case of obviousness as discussed below.

Independent claim 4 defines an in-plane switching liquid crystal display device. The apparatus includes, *inter alia*, "a common line on the first substrate, the common line being parallel with the gate line and being formed of a metal," "a plurality of pixel electrodes and a plurality of common electrodes having finger portions and arranged in parallel on the first substrate, the common electrodes being a transparent conductive second material different from the first material," "the common electrodes are formed on a same layer of the first substrate as the gate line," and "the common electrodes are arranged to directly contact the common line."

Independent claim 17 also defines an in-plane switching liquid crystal display device. The apparatus includes, *inter alia*, "a metal common line on the first substrate, the common line parallel to the gate line," "a plurality of common electrodes on the first substrate," "the common electrodes are a transparent conductive second material different from the first material, the pixel electrodes are one of a transparent and opaque material, and the common electrodes are formed on a same layer of the first substrate as the gate line," and "the common electrodes are arranged to directly contact the common line."

In rejecting claims 1 and 17, the Examiner asserts that APA discloses "the common electrodes are arranged to directly contact the common line," and refers to FIG. 8. of the application for support. FIG. 8 shows a common line 54 and common electrodes 54a (see page 7, lines 14-24). But it is clear from the disclosure and the illustration in FIG. 8 that the common line and common electrodes are formed at the same time from the same material and as a single

structural unit. The common line 54 and common electrodes 54a are not separate structures from one another as the claim requires. In fact, both claims 1 and 17 make clear that the common line and common electrodes are different materials. In claim 1, the common line is “formed of a metal” whereas the common electrodes are “a transparent conductive second material.” Claim 17 similarly recites “a metal common line” but it further recites “common electrodes are a transparent conductive second material”. Furthermore, FIG. 11 makes it clear that the common lines and common electrode overlap and are separate and distinct structures.

The Examiner does not suggest that any of Jeon, Wakagi, or Ando disclose or suggest these features, and a thorough review of these references reveals that they suffer the same deficiencies with respect to these elements of independent claims 1 and 17 as the APA.

In addition, claims 2, 5, 7, 10, and 12 and claims 18, 21, 22 and 33 respectively depend from independent claims 1 and 17. Therefore, claims 2, 5, 7, 10, 12, 18, 21, 22 and 33 are patentably distinguishable over the combination of APA Jeon, Wakagi, and Ando for at least those reasons presented above with respect to claims 1 and 17.

For at least those reasons present above, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 2, 4, 5, 7, 10, 12, 17, 18, 21, 22 and 33 under 35 U.S.C. §103(a). In addition, because the cited references considered separately or in combination do not disclose or suggest all of the elements of independent claims 1 or 17, Applicant respectfully requests reconsideration and withdrawal of all rejection claims 2-19 and 21-34 under 35 U.S.C. §103(a).

B. The Examiner improperly rejected claims 13-15 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of Yoshioka et al.; improperly rejected claims 3, 6 and 34 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of Colgan; improperly rejected claims 8, 9 and 32 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of Son; improperly rejected claims 23-25 and 27-30 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi and Ando and further in view of Ishikura; improperly rejected claims 26 and 31 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi, Ando and Ishikura and further in view of Colgan; and improperly rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Jeon, Wakagi, Ando and Yoshioka and further in view of Nakashima.

The rejections of the dependent claims are improper at least for the reasons present above with respect to independent claims 1 and 17. These rejections do not include rejections of the independent claims on other bases.

After careful review and examination of the cited references, Applicants note that the cited references do not cure the deficiencies in APA discussed above with respect to the independent claims 1 and 17.

Accordingly, the combination presented herein would still fail to render claims 2, 4, 5, 7, 10, 12, 17, 18, 21, 22, 33 and 34 unpatentable for at least the reason that the combination fails to disclose each and every claimed element of the independent claims 1 and 17.

Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 2-19 and 21-34 under 35 U.S.C. §103(a).

A copy of the claims involved in the present appeal is attached hereto as the Claims Appendix.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37 C.F.R. § 1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Dated: April 27, 2007

Respectfully submitted,

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**CLAIMS APPENDIX****Claims Involved In The Appeal Of Application Serial No. 09/039,438:**

1. (Canceled)
2. (Previously Presented) The device of claim 4, wherein the transparent conductive material includes indium tin oxide (ITO).
3. (Previously Presented) The device of claim 4, wherein the transparent conductive material includes indium zinc oxide (IZO).
4. (Previously Presented) An in-plane switching liquid crystal display device comprising:
  - a gate line formed of a first material on a first substrate;
  - a data line on the first substrate, the data line being perpendicular to the gate line;
  - a common line on the first substrate, the common line being parallel with the gate line and being formed of a metal;
  - a plurality of pixel electrodes and a plurality of common electrodes having finger portions and arranged in parallel on the first substrate, the common electrodes being a transparent conductive second material different from the first material, and the pixel electrodes being one of a transparent and opaque material;
  - a first connecting line parallel to the gate line, wherein the plurality of pixel electrodes are perpendicular to the first connecting line, first ends of the pixel electrodes are connected to the first connecting line and second ends of the pixel electrodes are connected to a second connecting line;
  - a storage electrode over the common line, wherein the storage electrode contacts the second connecting line via a storage contact hole;
  - a liquid crystal layer between the first and second substrates, wherein the common electrodes alternate with and are parallel to the pixel electrodes; and

an auxiliary common line on the first substrate, the auxiliary common line being connected with the common electrodes, wherein the common electrodes are formed on a same layer of the first substrate as the gate line,

wherein the common electrodes are arranged to directly contact the common line.

5. (Original) The device of claim 4, wherein the auxiliary common line includes indium tin oxide (ITO).

6. (Original) The device of claim 4, wherein the auxiliary common line includes indium zinc oxide (IZO).

7. (Previously Presented) The device of claim 4, wherein the common line includes a material selected from a group consisting of chromium (Cr), aluminum (Al), aluminum alloy (Al alloy), molybdenum (Mo), Tantalum (Ta), tungsten (W), antimony (Sb), and an alloy thereof.

8. (Previously Presented) The device of claim 4, further comprising a first alignment layer on the first substrate.

9. (Previously Presented) The device of claim 8, wherein the first alignment layer is selected from a group consisting of polyimide and photo-alignment material

10. (Previously Presented) The device of claim 4, further comprising a thin film transistor at an intersection of the gate and data lines.

11. (Withdrawn) The device of claim 5, wherein at least one of the pixel and common electrodes is on the same layer with the gate electrode.

12. (Previously Presented) The device of claim 4, further comprising a gate-insulating layer over the gate line.

13. (Original) The device of claim 12, further comprising a passivation layer over the gate-insulating layer.

14. (Previously Presented) The device of claim 13, wherein the pixel electrodes are on the passivation layer.

15. (Original) The device of claim 13, further comprising a black matrix on the passivation layer.

16. (Original) The device of claim 15, wherein the black matrix includes the same material as the pixel electrodes.

17. (Previously Presented) An in-plane switching Liquid Crystal Display (LCD) device, comprising:

- a first substrate and a second substrate;
- a gate line formed of a first material on the first substrate;
- a metal common line on the first substrate, the common line parallel to the gate line.
- a data line on the first substrate, the data line being perpendicular to the gate line;
- a plurality of common electrodes on the first substrate;
- a thin film transistor having a gate electrode, a source electrode and a drain electrode formed on the first substrate;
- a liquid crystal layer interposed between the first and second substrates;
- a plurality of pixel electrodes contacting the drain electrode of the thin film transistor;
- a first connecting line contacting the drain electrode and parallel to the gate line, wherein the plurality of pixel electrodes are perpendicular to the first connecting line, first ends of the pixel electrodes are connected to the first connecting line and second ends of the pixel electrodes are connected to a second connecting line; and
- a storage electrode over the common line, wherein the storage electrode contacts the second connecting line,
- wherein the common electrodes alternate with and are parallel to the pixel electrodes,

wherein the common electrodes are a transparent conductive second material different from the first material, the pixel electrodes are one of a transparent and opaque material, and the common electrodes are formed on a same layer of the first substrate as the gate line,  
and wherein the common electrodes are arranged to directly contact the common line.

18. (Original) The LCD device of claim 17, wherein a portion of the common line overlies a portion of the common electrode.

19. (Withdrawn) The LCD device of claim 17, wherein a portion of the common electrode overlies a portion of the common line.

20. (Canceled)

21. (Previously Amended) The LCD device of claim 17, wherein the storage electrode contacts the pixel electrodes through a storage contact hole.

22. (Previously Amended) The LCD device of claim 17, wherein the storage electrode is between the pixel electrodes and the first substrate.

23. (Previously Presented) The LCD device of claim 17, further comprising an auxiliary common electrode covering the common line, wherein the common electrodes are electrically connected to the auxiliary common electrode.

24. (Previously Presented) The LCD device of claim 23, wherein the auxiliary common electrode is formed of the same transparent material as the common electrodes.

25. (Original) The device of claim 23, wherein the auxiliary common electrode includes indium tin oxide (ITO).

26. (Original) The device of claim 23, wherein the auxiliary common line includes indium zinc oxide (IZO).



27. (Original) The LCD device of claim 23, further comprising a common pad at an end of the common line.

28. (Original) The LCD device of claim 17, further comprising an auxiliary gate line and a gate pad covering the gate line and the gate pad.

29. (Previously Presented) The LCD device of claim 28, wherein the auxiliary gate line is formed of the same transparent conductive material as the common electrodes.

30. (Original) The device of claim 28, wherein the auxiliary gate line includes indium tin oxide (ITO).

31. (Original) The device of claim 28, wherein the auxiliary gate line includes indium zinc oxide (IZO).

32. (Original) The LCD device of claim 17, further comprising a black matrix on the second substrate.

33. (Original) The LCD device of claim 17, wherein the transparent conductive material includes indium tin oxide (ITO).

34. (Original) The LCD device of claim 17, wherein the transparent conductive material includes indium zinc oxide (IZO).

35. (Withdrawn) An in-plane switching Liquid Crystal Display (LCD) device, comprising:

- a first substrate and a second substrate;
- a gate line formed of a first material on the first substrate;
- a metal common line on the first substrate, the common line parallel to the gate line.
- a data line on the first substrate, the data line being perpendicular to the gate line;
- a plurality of common electrodes of a transparent conductive second material different from the first material on the first substrate;

a thin film transistor having a gate electrode, an active layer, a source electrode and a drain electrode formed on the first substrate;  
a black matrix covering the active layer;  
a liquid crystal layer interposed between the first and second substrates; and  
a plurality of pixel electrodes of an opaque metal contacting the drain electrode of the thin film transistor, wherein the common electrodes alternate with and are parallel to the pixel electrodes, and  
wherein the common electrodes are on a same layer of the first substrate as the gate line.

36. (Withdrawn) The LCD device of claim 35, further comprising a black matrix formed of the same opaque metal as the pixel electrode.

37. (Withdrawn) The LCD device of claim 36, wherein the opaque metal is Cr.

38. (Withdrawn) The LCD device of claim 35, wherein the opaque metal is Cr.

39. (Withdrawn) A method of fabricating an in-plane switching liquid crystal display device, comprising:  
forming a gate line on a substrate;  
forming a common line spaced apart and parallel to the gate line;  
forming a data line spaced apart and perpendicular to the gate and common lines;  
forming gate and source electrodes near an intersection of the gate and data lines on an active layer, wherein the gate and source electrodes are electrically connected to the gate and data lines, respectively;  
forming a plurality of common electrodes on the substrate in contact with the common line;  
forming a drain electrode having a drain contact hole, wherein the drain electrode is spaced apart from the source electrode and overlaps a portion of the gate electrode;  
forming a gate insulating layer over the gate and common electrodes; and  
forming a plurality of pixel electrodes parallel to the common electrodes, wherein the pixel and common electrodes are formed from a transparent material.

40. (Withdrawn) A method of fabricating an in-plane switching liquid crystal display device, comprising:

- forming a plurality of common electrodes on a substrate;
- forming a common line on a substrate to overlap a portion of the common electrodes;
- forming a gate line spaced apart and in parallel to the common line;
- forming gate and source electrodes near an intersection of the gate and data lines on an active layer, wherein the gate and source electrodes are electrically connected to the gate and data lines, respectively;
- forming a data line spaced apart and perpendicular to the gate and common lines;
- forming a drain electrode having a drain contact hole, wherein the drain electrode is spaced apart from the source electrode and overlaps a portion of the gate electrode;
- forming a gate insulating layer over the gate and common electrodes; and
- forming a plurality of pixel electrodes parallel to the common electrodes, wherein the pixel and common electrodes are formed from a transparent material.

41. (Withdrawn) An in-plane switching liquid crystal display device comprising:

- a gate line formed of a first material on a first substrate;
- a data line on the first substrate, the data line being perpendicular to the gate line;
- a common line on the first substrate, the common line being parallel with the gate line and being formed of a metal;
- a plurality of pixel electrodes and a plurality of common electrodes having finger portions and arranged in parallel on the first substrate, the common electrodes being a transparent conductive second material different from the first material, and the pixel electrodes being one of a transparent and opaque material;
- a first connecting line parallel to the gate line, wherein the plurality of pixel electrodes are perpendicular to the first connecting line, first ends of the pixel electrodes are connected to the first connecting line and second ends of the pixel electrodes are connected to a second connecting line;
- a storage electrode over the common line, wherein the storage electrode contacts the second connecting line via a storage contact hole;
- a liquid crystal layer between the first and second substrates, wherein the common electrodes alternate with and are parallel to the pixel electrodes; and

an auxiliary common line on the first substrate, the auxiliary common line being connected with the common electrodes, wherein the common electrodes are formed on a same layer of the first substrate as the gate line,

wherein the common electrodes are formed on the common line, and

wherein the common electrodes are arranged to directly contact the common line.

42. (Withdrawn) An in-plane switching Liquid Crystal Display (LCD) device, comprising:

a first substrate and a second substrate;

a gate line formed of a first material on the first substrate;

a metal common line on the first substrate, the common line parallel to the gate line.

a data line on the first substrate, the data line being perpendicular to the gate line;

a plurality of common electrodes on the first substrate;

a thin film transistor having a gate electrode, a source electrode and a drain electrode formed on the first substrate;

a liquid crystal layer interposed between the first and second substrates;

a plurality of pixel electrodes contacting the drain electrode of the thin film transistor;

a first connecting line contacting the drain electrode and parallel to the gate line, wherein the plurality of pixel electrodes are perpendicular to the first connecting line, first ends of the pixel electrodes are connected to the first connecting line and second ends of the pixel electrodes are connected to a second connecting line; and

a storage electrode over the common line, wherein the storage electrode contacts the second connecting line,

wherein the common electrodes alternate with and are parallel to the pixel electrodes,

wherein the common electrodes are a transparent conductive second material different from the first material, the pixel electrodes are one of a transparent and opaque material, and the common electrodes are formed on a same layer of the first substrate as the gate line,

wherein the common electrodes are formed on the common line, and

wherein the common electrodes are arranged to directly contact the common line.

**EVIDENCE APPENDIX**

**Evidence:**

None.

**RELATED PROCEEDING APPENDIX**

**Related Proceedings:**

None.